



U.S. Department
of Transportation

**Research and
Special Programs
Administration**

OCT 16 2000

400 Seventh Street, S.W.
Washington, D.C. 20590

DOT-E 7737
(SIXTH REVISION)

EXPIRATION DATE: September 30, 2002

(FOR RENEWAL, SEE 49 CFR § 107.109)

1. GRANTEE: Cliff Acquisition Corp. dba Catalina Cylinders
Cliff Impact Division
Hampton, VA
2. PURPOSE AND LIMITATIONS:
 - a. This exemption authorizes the manufacture, mark, sale and use of a non-DOT specification cylinder conforming with all regulations applicable to a DOT specification 3E cylinder, except as specified herein; for the transportation in commerce of the materials authorized by this exemption. This exemption provides no relief from any Hazardous Materials Regulation (HMR) other than as specifically stated herein.
 - b. The safety analyses performed in development of this exemption only considered the hazards and risks associated with transportation in commerce. The safety analyses did not consider the hazards and risks associated with consumer use, use as a component of a transport vehicle or other device, or other uses not associated with transportation in commerce.
3. REGULATORY SYSTEM AFFECTED: 49 CFR Parts 106, 107 and 171-180.
4. REGULATIONS FROM WHICH EXEMPTED: 49 CFR §§ 173.201(c), 173.192, 173.302(a), 173.304(a) and (d), 173.337, and 175.3 in that a non-DOT specification cylinder is not authorized, except as specified herein.
5. BASIS: This exemption is based on the application of Cliff Acquisition Corporation dated September 26, 2000, submitted in accordance with § 107.109 and supplemental information dated October 17, 2000.

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6. HAZARDOUS MATERIALS (49 CFR § 172.101):

Proper Shipping Name/ Hazardous Material Description	Hazard Class/ Division	Identi- fication Number	Packing Group
Any hazardous material for which DOT specification 3AL cylinder is prescribed or authorized in 49 CFR Part 173	2.1, 2.2, 2.3 and 3	As appro- priate	As appro- priate

7. SAFETY CONTROL MEASURES:

a. PACKAGING - Packaging prescribed is a non-DOT specification seamless aluminum cylinder constructed in accordance with the design calculations dated April 6, 1977, Drawing 1575 Rev. Zero, dated March 1, 1977, Drawing 1575 Rev. B dated April 5, 1977 and Drawing 1575-A, dated June 21, 1977, on file with the Office of Hazardous Materials Exemptions and Approvals and conforming with the specifications for DOT 3E cylinder (§§ 178.35 and 178.42) except as follows:

§ 178.35(b) *Inspections and analysis.*

Chemical analyses and tests as specified must be made within the United States. Inspections and verifications must be performed by an independent inspection agency approved in writing by the Associate Administrator, in accordance with § 173.300a.

§ 178.35(f) *Markings.*

(1) The cylinder must be marked with the following information:

DOT-E7737-1800
CATALINA CLIFFDIV
MO-YR
ALUMINUM ALLOY

(2) Where: MO-YR is the month and year of test.

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§ 178.35(g) *Inspector's report.*

Applies except that the report must be modified as appropriate to accommodate 6061-T6 aluminum cylinder. The inspectors report on the first production lot must be submitted to the OHMEA prior to initial shipment.

§ 178.42(a) *Type, size and service pressure.*

The packaging must be a seamless aluminum cylinder and spun cylinder is not authorized.

§ 178.42(b) *Material.*

Aluminum used must be alloy 6061 and T-6 temper designated by the Aluminum Association with the following properties:

CHEMICAL COMPOSITION LIMITS⁽¹⁾

Aluminum Alloy Designation									Other ⁽²⁾		
	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Each	Total	Al
6061	0.40-0.80	0.70 Max.	0.15-0.40	0.15 Max.	0.8-1.2	0.04-0.35	0.25 Max.	0.15 Max.	0.05 Max.	0.15 Max.	Remainder

MECHANICAL PROPERTY LIMITS

Alloy and Temper	Tensile Strength - psi		Elongation Percent Minimum in 2" or 4D
	Ultimate-Minimum	Yield-Minimum	
6061-T6	38,000	35,000	10

(1) ASTM B 221-72 Standard Specification for Aluminum Alloy extruded Bars Rods, Shapes, and Tubes, Table 1 Chemical Composition Limits.

(2) Analysis is regularly made only for the elements for which specific limits are shown, except for unalloyed aluminum. If however, the presence of other elements is suspected to be, or in the course of routine analysis is indicated to be in excess of specified limits, further analysis is made to determine that these other elements are not in excess of the amount specified.

§ 178.42(c) *Identification of material.*

Material must be identified by any suitable method.

§ 178.42(d) *Manufacture.*

* * *

(Add) Cylinder shells must be manufactured by the Impact Extrusion Method and completed cylinder must be heat treated to the T-6 temper. Stress at minimum prescribed test pressure must not exceed 21,000 psi when calculated using the formula specified in § 178.36(f).

§ 178.42(e) *Openings in cylinders and connections.*

(1) * * *

(2) * * *

(3) Straight threads having at least 6 engaged threads are authorized. Straight threads must have a tight fit and a calculated shear strength at least 10 times the test pressure of the cylinder. Gaskets, adequate to prevent leakage, are required.

b. TESTING -

(1) *Design qualification tests.*

Prior to the initial shipment of any specific cylinder design, qualification tests as prescribed in this paragraph must have been performed and results submitted to the OHMEA. All cylinders used for design qualification test must be fabricated on the same equipment and subjected to the same processes as is used to produce cylinders intended for charging and shipment. All tests must be witnessed by an independent inspector.

(i) Cycling test must be performed by hydrostatically pressuring the cylinder between approximately zero psig and the designated pressure at a rate not in excess of 10 cycles per minute. All cylinders used in cycle tests must be destroyed.

(ii) Three representative cylinders must be cycle tested at ambient temperature, without showing evidence of distortion, deterioration or failure, as follows:

First pressurize from 0 to service pressure for 100,000 cycles. After successfully passing this test, the cylinder must be pressurized to burst and the burst pressure recorded.

(2) *Physical tests.*

(i) The yield strength, tensile strength and elongation must be determined as prescribed in § 178.37(k).

(ii) Ultimate tensile strength, yield strength and elongation must confirm to at least the values found in § 178.42(b) of this exemption.

(3) *Flattening test.*

(i) One cylinder out of each lot of 200 cylinders or less must be flattened between wedge shaped fixtures, 60° included angle, edges rounded as follows:

Cylinder wall thickness	Radius
under - .150	.500
.150 - .249	.875
.250 - .349	1.500

(ii) Cylinder must withstand to 9 times the wall thickness without cracking. Flattening to continue until cracking occurs and the point recorded on the report. Any cracking occurs must be longitudinal to the longitudinal axis of the cylinder.

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(4) *Burst test.*

One cylinder taken at random out of each lot of cylinders must be hydrostatically tested to destruction. Burst pressure must be at least 3.33 times marked service pressure.

8. SPECIAL PROVISIONS:

a. In accordance with the provisions of Paragraph (b) of § 173.22a, persons may use the packaging authorized by this exemption for the transportation of the hazardous materials specified in paragraph 6, only in conformance with the terms of this exemption.

b. A person who is not a holder of this exemption, but receives a package covered by this exemption, may reoffer it for transportation provided no modifications or changes are made to the package and it is offered for transportation in conformance with this exemption and the HMR.

c. A current copy of this exemption must be maintained at each facility where the package is offered or reoffered for transportation.

d. A current copy of this exemption must be maintained at each facility where the package is manufactured under this exemption. It must be made available to a DOT representative upon request.

e. The cylinder must be shipped in strong outer packagings in accordance with § 173.301(k).

f. Except as provided for in this exemption, a cylinder that is to be used as a tire inflator, and only when installed in the trunk of a motor vehicle, is excepted from 49 CFR Parts 171 - 180.

g. Flammable (Division 2.1) and toxic (Division 2.3) gases are not authorized for transportation by cargo vessel or by aircraft.

9. MODES OF TRANSPORTATION AUTHORIZED: Motor vehicle, rail freight, cargo vessel and cargo aircraft only (see paragraph 8.g. for restrictions).

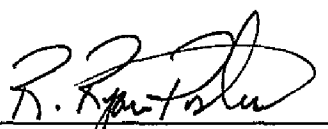
10. MODAL REQUIREMENTS: A current copy of this exemption must be carried aboard each cargo vessel, aircraft or motor vehicle used to transport packages covered by this exemption. The shipper must furnish a current copy of this exemption to the air carrier before or at the time the shipment is tendered.
11. COMPLIANCE: Failure by a person to comply with any of the following may result in suspension or revocation of this exemption and penalties prescribed by the Federal hazardous materials transportation law, 49 U.S.C. 5101 et seq:
- o All terms and conditions prescribed in this exemption and the Hazardous Materials Regulations, Parts 171-180.
 - o Registration required by § 107.601 et seq., when applicable.

Each "Hazmat employee", as defined in § 171.8, who performs a function subject to this exemption must receive training on the requirements and conditions of this exemption in addition to the training required by §§ 172.700 through 172.704.

No person may use or apply this exemption, including display of its number, when the exemption has expired or is otherwise no longer in effect.

12. REPORTING REQUIREMENTS: The carrier is required to report any incident involving loss of packaging contents or packaging failure to the Associate Administrator for Hazardous Materials Safety (AAHMS) as soon as practicable. (Sections 171.15 and 171.16 apply to any activity undertaken under the authority of this exemption.) In addition, the holder(s) of this exemption must also inform the AAHMS, in writing, as soon as practicable of any incidents involving the package and shipments made under this exemption.

Issued in Washington, D.C.


for Robert A. McGuire
Associate Administrator for
Hazardous Materials Safety

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Address all inquiries to: Associate Administrator for Hazardous Materials Safety, Research and Special Programs Administration, Department of Transportation, Washington, D.C. 20590.
Attention: DHM-31.

The original of this exemption is on file at the above office. Photo reproductions and legible reductions of this exemption are permitted. Any alteration of this exemption is prohibited.

Copies of exemptions may be obtained from the AAHMS, U.S. Department of Transportation, 400 7th Street, S.W., Washington, DC 20590-0001, Attention: Records Center, 202-366-5046.

PO: KFW/sln